What is claimed is:

1. A fuel injection assembly for direct fuel injection of low pressure gaseous fuel into a combustion chamber of an internal combustion engine, the assembly comprising:

    at least one nozzle having at least one nozzle passage formed by an annular nozzle wall, the at least one nozzle having a nozzle inlet and nozzle outlet, the at least one nozzle passage including a converging portion adjacent the nozzle inlet and a diverging portion adjacent the nozzle outlet, the converging and diverging portions being disposed between the nozzle inlet and outlet;

    a first critical orifice disposed between the converging and diverging portions of the at least one nozzle passage; and

    valve means for controlling the first critical orifice such that at least a portion of the fuel flow passing through the first critical orifice reaches at least sonic velocity as it travels through the diverging portion of the at least one nozzle passage and exits the nozzle outlet.

2. The assembly of claim 1, wherein the diverging nozzle portion is configured such that at least one Mach disc is created as the fuel exits the nozzle passage and enters a combustion chamber of an internal combustion engine.

3. The assembly of claim 2, wherein the gaseous fuel supply is supplied at a pressure between about 50 and about 150 PSIG.

4. The assembly of claim 3, wherein the gaseous fuel supply is supplied at a pressure between about 60 and about 120 PSIG.

5. The assembly of claim 4, wherein the gaseous fuel supply is supplied at a pressure between about 60 and about 95 PSIG.

6. The assembly of claim 1, wherein the first critical orifice is an annular gap formed between the valve means and the annular nozzle wall upon activation of the valve means.

7. The assembly of claim 6, wherein the longitudinal axial length of the diverging portion is between about 15 and about 50 times the width of the annular gap that forms the first critical orifice.

8. The assembly of claim 7, wherein the longitudinal axial length of the diverging portion of the at least one nozzle is between about 25 to about 35 times the width of the annular gap that forms the first critical orifice.

9. The assembly of claim 1, wherein the valve means is a poppet valve having a head with circumferential edges configured to create a gap between the circumferential edges and the surrounding annular nozzle wall, the gap forming the first critical orifice when the valve is open, the edges further configured so as to seat against the surrounding annular nozzle wall when the valve is closed.

10. The assembly of claim 10, wherein the at least one nozzle passage includes a second converging portion disposed below the first critical orifice, wherein the second converging portion is configured to serve as a transportation stop for the poppet valve when the valve is in the open position.

11. A fuel injection assembly for direct fuel injection of low pressure gaseous fuel into a combustion chamber of an internal combustion engine, the assembly comprising:

at least one nozzle having a first nozzle passage formed by an annular nozzle wall, the first nozzle passage having a first nozzle inlet and first nozzle outlet, the first nozzle passage having a converging portion adjacent the first nozzle inlet and a diverging portion adjacent the first nozzle outlet, the converging and diverging portions of the first nozzle passage being disposed between the first nozzle inlet and first nozzle outlet;

a first critical orifice disposed between the converging and diverging portions of the first nozzle passage;

a second critical orifice disposed within a second nozzle passage, the second nozzle passage having a second nozzle inlet in communication with the first nozzle passage and a second nozzle outlet, the second nozzle passage having a converging portion adjacent the second nozzle inlet and a diverging portion adjacent the second nozzle outlet, the converging and diverging portions of the second nozzle passage separated by a second critical orifice;

valve means for simultaneously controlling the first critical orifice and the inlet to the second nozzle passage, such that at least a portion of the fuel

flow passing through the first critical orifice reaches at least sonic velocity as it travels through the diverging portion of the first nozzle passage and exits the first nozzle passage, and such that at least a portion of fuel flow passes through the second critical orifice in the second nozzle passage and reaches at least sonic velocity as it travels through the diverging portion of the second nozzle passage and exits the second nozzle passage.

12. The assembly of claim 11, wherein diverging portion of the first nozzle passage and the diverging nozzle portion of the second nozzle passage are configured such that at least one Mach disc is created as the fuel exits the first nozzle passage and the second nozzle passage.

13. The assembly of claim 12, wherein the gaseous fuel supply is supplied at a pressure between about 50 and about 150 PSIG.

14. The assembly of claim 13, wherein the gaseous fuel supply is supplied at a pressure between about 60 and about 120 PSIG.

15. The assembly of claim 14, wherein the gaseous fuel supply is supplied at a pressure between about 60 and about 95 PSIG.

16. The assembly of claim 11, wherein the first critical orifice is an annular gap formed between the valve means and the annular nozzle wall upon activation of the valve means.

17. The assembly of claim 16, wherein the longitudinal axial length of the diverging portion of the first nozzle passage is between about 15 and about 50 times the width of the annular gap that forms the first critical orifice.

18. The assembly of claim 17, wherein the longitudinal axial length of the diverging portion of the first nozzle passage is between about 25 to about 35 times the width of the annular gap that forms the first critical orifice.

19. The assembly of claim 11, wherein the valve means is a poppet valve having a head with circumferential edges configured to create a gap between the circumferential edges and the surrounding annular nozzle wall, the gap forming the first critical orifice when the poppet valve is open, the edges further configured so as to seat against the surrounding annular nozzle wall when the poppet valve is closed.

20. The assembly of claim 19, wherein the first nozzle passage includes a third converging portion disposed below the first critical orifice, wherein the third converging portion is configured to serve as a transportation stop for the poppet valve when the poppet valve is in the open position.

21. A gaseous fueled internal combustion engine, the engine comprising

At least one fuel injection assembly for gaseous fuel, each fuel injection assembly comprising:

at least one nozzle having at least one nozzle passage formed by an annular nozzle wall, the at least one nozzle having a nozzle inlet and nozzle outlet, the at least one nozzle passage including a converging portion adjacent the nozzle inlet and a diverging portion adjacent the nozzle outlet, the converging and diverging portions being disposed between the nozzle inlet and outlet;

a first critical orifice disposed between the converging and diverging portions of the at least one nozzle passage; and

valve means for controlling the first critical orifice such that at least a portion of the gaseous fuel passing through the first critical orifice reaches at least sonic velocity as it travels through the diverging portion of the at least one nozzle passage and exits the nozzle outlet;

a fuel connection to a low pressure gaseous fuel supply;

the fuel supply being operatively connected to the nozzle inlet; and

a combustion chamber being operatively connected to the nozzle outlet.

22. The engine of claim 21, wherein the diverging nozzle portion is configured such that at least one Mach disc is created as the gaseous fuel exits the nozzle passage and enters the combustion chamber of an internal combustion engine.

23. The engine of claim 21, wherein the gaseous fuel supply is supplied at a pressure between about 50 and about 150 PSIG.

24. The engine claim 21, wherein the first critical orifice is an annular gap formed between the valve means and the annular nozzle wall upon activation of the valve means.

25. The engine of claim 24, wherein the longitudinal axial length of the diverging portion is between about 15 and about 50 times the width of the annular gap that forms the first critical orifice.

26. The engine of claim 21, wherein the valve means is a poppet valve having a head with circumferential edges configured to create a gap between the circumferential edges and the surrounding annular nozzle wall, the gap forming the first critical orifice when the valve is open, the edges further configured so as to seat against the surrounding annular nozzle wall when the valve is closed.

27. The engine of claim 26, wherein the at least one nozzle passage includes a second converging portion disposed below the critical orifice, wherein the second converging portion is configured to serve as a transportation stop for the poppet valve when the valve is in the open position.

28. The engine of claim 21, wherein the fuel injector assembly further comprises:

a second critical orifice disposed within a second nozzle passage, the second nozzle passage having a second nozzle inlet in communication with the first nozzle passage and a second nozzle outlet, the second nozzle passage having a converging portion adjacent the second nozzle inlet and a diverging portion adjacent the second nozzle outlet, the converging and diverging portions of the second nozzle passage separated by a second critical orifice;

and wherein the valve means simultaneously controls the first critical orifice and the inlet to the second nozzle passage, such that at least a portion of the fuel flow passing through the first critical orifice reaches at least sonic velocity as it travels through the diverging portion of the first nozzle passage and exits the first nozzle passage, and such that at least another portion of the fuel flow passes through the second critical orifice in the second nozzle passage and reaches at least sonic velocity as it travels through the diverging portion of the second nozzle passage and exits the second nozzle passage.